

MATERNAL DEPRESSIVE SYMPTOMS, MATERNAL SENSITIVITY,
AND TODDLER NON-COMPLIANCE AT 24 MONTHS

by

Roli Mohan

BA, Concordia University, 1998

Submitted to the Graduate Faculty of
The Department of Psychology in partial fulfillment
of the requirements for the degree of
Masters of Science

University of Pittsburgh

2004

UNIVERSITY OF PITTSBURGH

FACULTY OF ARTS AND SCIENCES

This thesis was presented

by

Roli Mohan

It was defended on

Feb 28, 2003

and approved by

Celia E. Brownell, Associate Professor, Department of Psychology

Kay D. Jennings

Associate Professor, Dept. of Psychiatry, School of Medicine
(Secondary appointment in Dept. of Psychology)

Thesis Advisor: Susan B. Campbell, Professor, Department of Psychology

Copyright © Roli Mohan
2004

MATERNAL DEPRESSIVE SYMPTOMS, MATERNAL SENSITIVITY, AND TODDLER NON-COMPLIANCE AT 24 MONTHS

Roli Mohan, MS

University of Pittsburgh, 2004

The association between maternal depressive symptoms and toddlers' self-regulation, as indexed by non-compliance, negative affect and disengagement, and externalizing problems was examined in 1189 mother-child dyads when the children were 24 months old. Maternal sensitivity, observed when children were 6, 15, and 24 months, was investigated as a possible mediator or a moderator of links between maternal depressive symptoms and children's regulatory behavior. Depressive symptoms were examined both as a continuous measure and categorically (never, sometimes, chronic) to assess the effects of depression chronicity. All associations were examined after controlling for maternal education, partner presence, and family income. Child outcomes at 24 months were assessed with a combination of observational and maternal report measures. Both maternal depressive symptoms and maternal sensitivity were associated with most measures of self-regulation, and were negatively correlated with each other. Minimal support was observed for maternal sensitivity as a mediator of the link between maternal depressive symptoms and child outcomes, although both independently predicted some child outcomes even with demographics controlled. No evidence was found to support

moderation. When chronicity of depression was examined as a categorical variable, the findings were consistent with those obtained when depressive symptoms were analyzed as a continuous measure. Implications of the findings for understanding the association between maternal depression and child functioning are discussed.

TABLE OF CONTENTS

1. INTRODUCTION	1
2. METHOD	16
2.1. PARTICIPANTS	16
2.2. PROCEDURE.....	17
2.3. MEASURES	18
2.3.1. Demographics	18
2.3.2. Maternal measures	19
2.3.3. Child Outcome measures	22
3. RESULT	27
3.1. PRELIMINARY ANALYSES	27
3.1.1. Maternal depressive symptoms and demographics.....	28
3.1.2. Child outcomes and demographics	28
3.1.3. Maternal sensitivity and demographics	29
3.2. DEPRESSIVE SYMPTOMS AS A CONTINUOUS VARIABLE.....	30
3.2.1. Maternal sensitivity as a mediator	30
3.2.2. Maternal sensitivity as a moderator	36
3.3. CHRONICITY OF DEPRESSIVE SYMPTOMS	37
3.3.1. Chronicity of depressive symptoms and child outcomes.....	38
3.3.2. Chronicity of depressive symptoms and maternal sensitivity.....	40
3.3.3. Maternal sensitivity and child outcomes.....	40
3.3.4. Role of maternal sensitivity as a potential mediator	40
3.3.5. Maternal sensitivity as a potential moderator	40
4. DISCUSSION	43
4.1. LIMITATIONS AND FUTURE DIRECTIONS.....	49
BIBLIOGRAPHY	51

LIST OF TABLES

Table 1: Summary of Child Outcome Variables.....	22
Table 2: Zero-order correlations between child outcome variables.....	28
Table 3: Zero-order correlations and descriptive statistics for demographic variables, maternal depression, maternal sensitivity, and child	29
Table 4: Summary of regression analyses predicting compliance with the Bayley examiner.....	33
Table 5: Summary of regression analyses predicting negative affect and disengagement.....	35
Table 6: Summary of regression analyses predicting maternal reports of externalizing.....	35
Table 7: Summary of regression analyses predicting maternal report of ASBI	36
Table 8: N, means, and standard deviations for the chronicity of depressive symptoms by child outcomes	38
Table 9: Summary of analyses of covariance examining the role of maternal sensitivity as a potential mediator of the association between the chronicity of depressive symptoms and maternal reports of externalizing behavior problems	39
Table 10: Summary of analyses of covariance examining the role of maternal sensitivity as a potential mediator of the association between the chronicity of depressive symptoms and maternal reports of ASBI compliance.....	41
Table 11: Estimated marginal means for the chronicity of depressive symptoms and maternal sensitivity predicting child outcomes after controlling for the demographics variables.	42

LIST OF FIGURES

Figure 1: Mediational model (role of maternal sensitivity as a mediator of the association between maternal depressive symptoms and child outcomes)	31
---	----

1. INTRODUCTION

In the recent decades there has been a major focus on the association between maternal depressive symptoms and child development. In a review of studies examining this association Downey and Coyne (1990) and Cummings and Davies (1994) concluded that children of mothers manifesting depressive symptoms are at high risk for a wide range of problems such as anxiety and depressive disorders (Rutter & Quinton, 1984); externalizing behavior problems (Zahn-Waxler, Cummings, McKnew, & Radke-Yarrow, 1984); deficits in cognitive functioning (Lyons-Ruth, Zoll, Connell, & Grunebaum, 1986 as in Cohn & Campbell, 1992); emotion regulatory skills (Zahn-Waxler et al. 1984); attentional problems (Grunebaum, Cohler, & Kauffman, 1978 as in Dodge, 1990); and somatic symptoms (Whiffen & Gotlib, 1989). According to Gelfand and Teti (1990), risk for emotional and behavioral problems associated with maternal psychopathology may be a function of child age and developmental status. Whereas older children may experience problems associated with school achievement and peer relationships, and infants may experience attachment difficulties, toddlers are more likely to experience problems related to the development of self-regulation and autonomous behavior (Gelfand & Teti, 1990).

It has been suggested that depressive symptoms may be associated with negative child outcomes because they compromise mothers' parenting skills (Cummings, Davies, & Campbell, 2000; Cummings & Davies, 1994; Downey & Coyne, 1990; Gelfand & Teti, 1990). Depressive symptoms such as dysphoria, withdrawal, disengagement, lack of responsiveness and

availability, or anger, irritability, intrusiveness, and harshness have been found to be associated with less sensitive parenting behavior. Depressive symptoms may compromise mothers' parenting skills because sad and preoccupied women are less sensitive to their young child's needs and social communications. This study will examine whether there is an association between maternal depressive symptoms and toddlers' self-regulation, as indexed by noncompliance, negative affect, and problem behavior. Second, this study also will examine whether maternal sensitivity accounts for the association between maternal depressive symptoms and noncompliance.

In early childhood, children learn many skills that foster the development of self-regulation and help them to function as independent social beings. Self-regulation has been defined in various ways, such as an ability to comply with requests, to initiate and cease activities according to situational demands, to postpone acting upon a desired object or goal, and to generate socially appropriate behavior in the absence of an external monitor (Kopp, 1982). The notion underlying these various definitions is the recognition that self-regulation involves the ability to modulate one's behavior and affect in line with socially acceptable standards. Since self-regulation demands awareness of socially acceptable standards of conduct, self-regulatory capacities emerge in early childhood partly as a result of socialization by others. In infancy and toddlerhood, parents make a concerted effort to socialize their children by fostering prosocial behaviors such as cooperation and compliance, and by emphasizing control of negative affect.

Along with self-regulatory capacities, toddlerhood is also a crucial time for the development of autonomy. The emerging understanding of the distinction between self and other facilitates children's efforts to establish the independent self and to begin to function autonomously. An indication of children's growing autonomy is their willingness to say 'no' to

parental demands (Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987; Crockenberg & Litman, 1990) because their wishes and desires may not always be in accord with parental goals. Parental efforts at limit setting and control may be met with resistance from children intent on their own independent agendas. Children may exert their autonomy by not complying with parents' requests or by complying unwillingly. The emergence of the understanding of when to comply with parental directives and when to negotiate one's own agenda may be reflective of a balance between the development of good self-regulatory skills and an ability to exert autonomy in socially appropriate ways. Compliant behavior, that is willingly following caregivers' requests or demands, is considered one index of self-regulation in toddlerhood (Kopp, 1982; Vaughn, Kopp, & Krakow, 1984); whereas non-compliance, which refers to overtly or covertly refusing to follow the caregiver's directives, is sometimes an index of poor self-regulatory abilities, and sometimes reflects autonomous functioning.

Depending upon the context, certain strategies of non-compliance may be considered inappropriate means of exerting autonomy whereas others are considered more mature. According to Crockenberg and Litman (1990) children may use any of a variety of strategies such as defiance, passive non-compliance, simple refusal, negotiation, or compliance in response to parental demands. While passive non-compliance refers to a strategy of not paying attention to parental requests or demands, defiance refers to overtly resisting the adult and is often accompanied by a combination of anger, negative affect, temper tantrums, crying, and whining. When children are defiant or show passive non-compliance, it is generally assumed that they do not intend to cooperate to work toward a common goal. Simple refusal (simply saying "no" to parental requests) and negotiation are seen as positive ways of exerting autonomy (Crockenberg & Litman, 1990).

Like non-compliance, various strategies of compliance may have a different meaning depending upon the context. Kochanska, Tjebkes, and Forman (1998) have distinguished between compliance that reflects willingness on the child's part and compliance that may be due to submission to external pressure. According to Kochanska and colleagues "committed compliance indicates instances when the child appears to wholeheartedly embrace the maternal agenda, endorses it as his or her own, and enthusiastically follows maternal directives in a self-regulated proactive manner, not contingent upon immediate maternal control". By contrast, "situational compliance refers to instances when the child, although essentially cooperative and nonoppositional, does not appear genuinely to embrace the maternal agenda, and compliance seems mostly reactive, perfunctory, "half-hearted", or "shaky", and sustained mostly by her continuing control. The child's motivation, although not negativistic, appears to be driven by external factors rather than originating "inside"." (page 1378). Kochanska, Tjebkes, and Forman also noted that toddlers who exhibited high levels of committed compliance were also observed to be oriented toward their mothers in a teaching context. These children were more receptive, eager, and more willing to follow the maternal agenda.

Research examining the impact of socialization processes on the development of compliance as an index of self-regulatory behavior has focused primarily on maternal parenting strategies. It has been argued that maternal behaviors, more so than that of others, are likely to be associated with the development of compliance in children since they are the primary caregivers in infancy and toddlerhood. In line with such an hypothesis, numerous studies have indicated that negative maternal strategies seem to be more likely to elicit negative responses from children, whereas positive strategies are more likely to elicit positive responses (Crockenberg & Litman, 1990; Kochanska et al. 1998). For example, Kuczynski et al. (1987) examined developmental

changes in maternal control strategies and children's responses in 70 mother-child dyads. Mothers' use of reasoning and suggestion were more likely to be associated with children's use of negotiation, whereas direct maternal strategies were more likely to be associated with defiance. Similarly, Crockenberg and Litman (1990) found that mothers who used high levels of negative control were more likely to elicit defiance from children, whereas guidance coupled with control increased compliance or self-assertive behaviors.

Belsky, Woodworth, and Crnic (1996) identified families who were "troubled" when children were 15 and 21 months old. These children had elevated ratings of "externalizing problems" compared to children in families who were considered troubled only at 15 or 21 months, or not at all. Based on Belsky's model of the determinants of parenting, it was found that in troubled families, mothers and fathers both were more likely to use negative control tactics with their children, and less likely to use control plus guidance. In these families, toddlers were more likely to defy their mothers and fathers, and less likely to comply with their control efforts. Mother-child and father-child interactions often ended in escalating negative affect.

In summary, the picture that emerges indicates that the use of negative control tactics by mothers may be associated with higher levels of defiance and lower levels of compliance. According to Crockenberg and Litman, parental efforts to set limits coupled with guidance, perhaps poses appropriate demands for maturity, but is also sensitive to the child's feelings and desires, and therefore is more likely to elicit compliance.

The need to set limits and impose standards of appropriate conduct on toddlers is apparent. It is also clear that the manner in which parents attempt to socialize their children is important. There is a growing body of work that focuses on factors associated with individual differences in parenting. Among the most examined factors are maternal depressive symptoms.

Examinations of interactions of depressed mothers with their children indicate that compared with nondepressed mothers, mothers manifesting depressive symptoms respond to their children by being harsh, punitive, and controlling on the one hand, and by withdrawal and disengagement on the other (Cohn, Matias, Tronick, Connell, & Lyons-Ruth, 1986; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990; Gelfand & Teti, 1990; Radke-Yarrow, Nottelmann, Belmont, & Darby-Welsh, 1993; Campbell, Cohn, & Myers, 1995; Leadbeater, Bishop, & Raver, 1996).

Theory and research in the field of child development emphasize that depressive symptoms may compromise mothers' parenting skills (Cummings, Davies, & Campbell, 2000; Rutter, 1990; Gelfand & Teti, 1990; Cox, Puckering, Pound, & Mills, 1987). Either singly or in combination, depressive symptoms, such as withdrawal, lack of involvement in activities, lack of responsiveness, or irritability, and harshness, perhaps render it difficult for mothers to meet the demands of their toddlers who require consistent guidance and monitoring as well as emotional warmth and engagement. Withdrawn, disengaged, and emotionally distanced mothers who are unable to set appropriate limits make it harder for children to learn appropriate regulation of behavior and affect. Whereas harsh and punitive control on the mothers' part may force toddlers to comply with maternal directives, it may also elicit negative affect and interfere with the development of autonomy. Moreover, lack of consistency in mother's behavior, that is, unpredictable switches between punitive discipline and withdrawal, is likely to provide an ambiguous and inconsistent model of social behavior. The lack of guidance coupled with inappropriate limit setting may not help children learn when to comply with parental demands and when to negotiate their personal agenda. Depending upon the context or the child's temperamental disposition, undercontrol or overcontrol by mothers may elicit a number of different responses from children, such as defiance, passive non-compliance, or mere situational

compliance. In addition to the inability to provide appropriate control, a lack of warm and sensitive engagement may elicit negative affect from the child along with noncompliance. Thus, the difficulty that some depressed mothers have coping with the increased challenges of socializing their toddler may have an impact on the development of their young children's self-regulation. Measures of compliance and externalizing behavior are often used as behavioral indices of self-regulation (Kopp, 1982). To gain a better understanding of one's ability to self-regulate it is important to look at not only the individual's ability to regulate his or her behavior but also the ability to regulate affect. Socialization goals place more emphasis on the regulation of negative affect. In addition, defiant or non-compliant behavior is generally accompanied by negative affect. Therefore, negative affect and disengagement in addition to measures of compliance and externalizing behaviors will be examined in this study of self-regulation at 24 months.

The literature is sparse on the association between maternal depressive symptoms and compliant behavior. The studies that have investigated this association indicate a mixed picture; while some studies found support for such an association, others did not. For example, Kuczynski et al. (1987) examined developmental changes in maternal control strategies and children's noncompliance in 1-1/2 to 3-1/2 year old children of depressed and nondepressed mothers. Overall, children of depressed mothers were not more noncompliant than the children of nondepressed mothers. However, an interaction between gender and maternal depressive status was noted for immediate compliance and passive noncompliance, suggesting that girls of nondepressed mothers were more compliant and less passively non-compliant than the girls of depressed mothers and the boys of nondepressed mothers. No differences were observed between the boys and girls of depressed mothers. Kochanska, Kuczynski, Radke-Yarrow, and

Welsh (1987) investigated the resolution of control episodes between nondepressed mothers and those suffering from unipolar or bipolar depression, and their 15 to 51 month old children. Kochanska et al. noted that the severity of the mothers' disorder was associated with an increase in unresolvable episodes. In addition, an effect of depression was found only for girls, such that nondepressed mothers reached compromise more often, and received more cooperation from their daughters more often than did depressed mothers. In an examination of interaction patterns of 29 clinically depressed and 14 nondepressed mothers and their 13-29 month old children, Jameson, Gelfand, Kulcsar, and Teti (1997) did not find the children of depressed mothers to be less compliant than those of nondepressed mothers.

In summary, studies examining the association between maternal depressive symptoms and noncompliance are equivocal. Studies that did find an effect of depression have not found consistent results for both boys and girls. There may be several explanations for this lack of conclusive evidence. Issues around the construct of depression, such as the heterogeneity of depressive symptoms, sampling of depressed mothers, assessment of depressive symptoms, the timing and chronicity of the symptoms, and sample sizes need a closer look. However it may also be, as the larger literature on maternal depression and child development points out, that distal stressors such as low education, family socio-economic status, or marital discord may account for the relationship between maternal depressive symptoms and child development through their indirect influence on parenting skills (see Downey & Coyne, 1990; Teti, Gelfand, & Pompa, 1990; Cummings & Davies, 1993).

Maternal depression is a heterogeneous construct, defined differently in different studies. For example, it is important to distinguish between clinical samples of depressed women and community samples. Some studies have employed clinical samples of mothers using DSM

criteria to identify women with diagnosable depressive disorders, whereas others have examined community samples and used self-reports to identify women manifesting depressive symptoms. In addition, it is important to distinguish between depressive symptoms that vary in their severity and chronicity. Severe and chronic depression may have a greater impact on parenting skills than depressive episodes that are sporadic (NICHD Early Child Care Research Network, 1999). Campbell, Cohn and Myers (1995) found that women who were chronically depressed from the postpartum period through 6 months were less positive with their infants during face-to-face play and less sensitive and engaged during feeding and play than women whose depression had remitted by 6 months. The NICHD Early Child Care Research Network (1999) also reported that mothers with chronic symptoms of depression were observed to be in general the least sensitive with children in play settings from infancy through 36 months.

Another shortcoming in the literature examining the association between maternal depressive symptoms and child outcomes is the sole reliance on maternal reports for assessing child outcomes. While it is important to obtain mothers' perceptions of their children, maternal reports of child functioning may be problematic because depressive symptoms may bias mothers' impressions of their child's behavior (Webster-Stratton & Hammond, 1988; Friedlander, Weiss, & Traylor, 1986; Schaughency & Lahey, 1985). Although Richters and others assert that no clear evidence exists indicating that mothers manifesting depressive symptoms hold biased perceptions of their children (see Richters, 1992; Richters & Pellegrini, 1989), the widely held view is that depressed mothers who may find it very difficult to provide adequate guidance, supervision and warmth to their child also may view their child as unmanageable. Hence, there has been an increasing tendency to use observational measures of children's behavior.

While observations of mother-child dyadic interactions provide us with important information about mother-child interaction quality, they do not inform us about whether children's noncompliance in the laboratory observation is a transitory response to the ongoing maternal behavior, is specific to the relationship as a result of continual interactions with a depressed caregiver, or whether their behavior generalizes to other individuals as well. To assess whether the association between maternal depressive symptoms and child non-compliance reflects general non-compliance and thus, generalizes to children's interactions with other individuals, it is important to observe children's interactions not only with mothers but also with other adults. Thus, in the present study, compliance with the examiner is also included.

In summary, studies examining the association between maternal depressive symptoms and child non-compliance have not provided conclusive results. Research on this question would benefit from a larger sample size than used in past studies. Further, severity and chronicity of maternal depressive symptoms should be taken into account for a clearer understanding of the impact of depression on parenting skills. Also, distal factors, such as the presence or absence of a partner, family's socio-economic status, and low educational level may partly explain the association between depressive symptoms and children's non-compliance, and they need to be examined. Moreover, and perhaps more importantly, proximal factors, such as maternal sensitivity, that may provide a direct mechanism through which maternal depressive symptoms may compromise parenting skills, deserve serious attention as well.

The importance of maternal sensitivity has been demonstrated in the NICHD Study of Early Child Care (NICHD ECCRN, 1999b). In this longitudinal study, infants were followed from birth to 36 months, and maternal depressive symptoms were assessed using maternal self-reports. Maternal sensitivity accounted for some group differences in children of mothers with

chronic, intermittent, or no depressive symptoms on measures such as school readiness and verbal comprehension. Maternal sensitivity moderated this association for expressive language and cooperation. In general, children had higher ratings on the Reynell Developmental Language Scale if their mothers were more sensitive especially if they were also never depressed or depressed only sometimes. Children whose mothers were chronically depressed received lower ratings on the expressive language scale if their mothers were also less sensitive than if they were more sensitive. More sensitive mothers irrespective of whether they were chronically depressed or depressed only sometimes rated their children as more cooperative than mothers who were depressed and also less sensitive. Mothers who were depressed and also were less sensitive, rated their children as less cooperative.

It is apparent from these data that whereas the chronicity of depressive symptoms is associated with more negative child outcomes, maternal sensitivity acts as a buffer. Sensitive mothering may alleviate some of the risk for negative outcomes associated with depressive symptoms. Zahn-Waxler, Iannotti, Cummings and Denham (1990) reported that although depressed mothers in general used negative strategies with their 2- year-olds such as overprotectiveness, inconsistent behavior, and guilt and anxiety arousal, not all depressed mothers were insensitive. According to Zahn-Waxler et al. (1990) some depressed mothers were observed to use proactive strategies such as anticipatory guidance, respectful control, and organizing structure in the play environment. The children of depressed mothers who used proactive strategies exhibited fewer externalizing behavior problems three years later than children of depressed mothers who did not use such positive strategies with their children at age 2. Hence, it appears that although depressed mothers use more harsh and punitive disciplinary techniques in general and are emotionally less responsive and available to their child, not all

depressed mothers are insensitive. In line with such results it would be reasonable to expect that maternal sensitivity may moderate the association between maternal depressive symptoms and non-compliance in toddlers.

In summary, a review of previous research proposes that depressive symptoms are likely to compromise mothers' parenting skills and may place their children at some disadvantage for various outcomes. In toddlerhood the risks are likely to be associated with the development of self-regulation and autonomy, as indexed by compliant behavior, negative affect and disengagement, and externalizing problems. Further, based on studies suggesting that the more chronic the depressive symptoms, the more the disadvantage to children, it is likely that children of chronically depressed mothers will be more noncompliant in toddlerhood than children whose mothers are depressed only sometimes. While demographic factors such as maternal education, family income, and marital status may partly explain the association between maternal depressive symptoms and noncompliance, this association also may be explained by maternal sensitivity. In the proposed study, we will examine whether maternal sensitivity accounts for the association between maternal depressive symptoms and child non-compliance after controlling for demographic variables. We will also examine whether maternal sensitivity moderates the association between depression groups (never, sometimes, or chronic maternal depressive symptoms) and children's self-regulation in toddlerhood.

This study has several advantages over previous work. First, while previous studies were limited in their sample sizes, this study will use a very large and relatively representative sample to examine the questions of interest. Second, the large sample size allows us to examine group differences between children of never, sometimes, and chronically depressed mothers. Third, besides maternal reports of child noncompliance and externalizing behavior problems, we will

also include observations of mother-child interactions as well as stranger-child interaction to measure child noncompliance. To obtain an overall picture of children's noncompliant behavior, negative affect and disengagement will also be observed during interactions with the mother. Fourth, the extensive nature of this study allows us to examine the association between maternal depressive symptoms and non-compliance over and above factors such as child sex, family income, maternal education level, and marital status.

This study used data from an ongoing study, the NICHD Study of Early Child Care (SECC). In the NICHD SECC mother-child interactions were observed at home (6 and 15 months) and in the laboratory when the children were 24-months-old. At 24 months mothers' reports of children's behaviors also were obtained. Each child was observed in a series of interactions with the mother and an examiner. Non-compliance was measured during a laboratory clean up task with the mother and with the examiner during the Bayley Test of Mental Development. Negative affect and disengagement from the ongoing activity were observed during a semi-structured play interaction with the mother. Maternal sensitivity was also measured during the mother-child play interaction. In addition, mothers completed the Child Behavior Checklist- 2/3 (CBCL-2/3; Achenbach, Edelbrock, & Howell, 1987) and the Adaptive Social Behavior Inventory (ASBI; Hogan, Scott, & Bauer, 1992) in the laboratory. The following hypotheses were examined:

1. Both continuous and categorical measures of maternal depressive symptoms measured using the CES-D will be associated with measures of child non-compliance, negative affect and disengagement, and externalizing behavior problems. These include: compliance during the laboratory clean up task, non-compliance with the Bayley examiner, negative affect and disengagement during mother-child play, mother reports of

externalizing behavior problems, and mother reported compliance. These associations will be evident even after child sex, maternal education level, family income, and mothers' marital status during the first two years of the child's life are controlled.

2. Maternal sensitivity observed during a mother-child play interaction will be associated with the continuous and categorical measures of maternal depressive symptoms as measured by CES-D. Mothers with more depressive symptoms will be less sensitive. Moreover, it is expected that mothers with chronic depressive symptoms will be the least sensitive.
3. Maternal sensitivity also will be associated with the child outcome measures. It is expected that children whose mothers are less sensitive will be more noncompliant, more negative, and obtain higher ratings of behavior problems.
4. Maternal sensitivity will mediate the association between maternal depressive symptoms (both continuous and categorically) and measures of non-compliance, negative affect and disengagement, and externalizing behavior. That is, the association between maternal depressive symptoms and child outcomes will be attenuated to a significant degree with maternal sensitivity in the model.
5. Maternal sensitivity will moderate the association between maternal depressive symptoms and measures of non-compliance, negative affect and disengagement, and externalizing behavior. When analyzing maternal depressive symptoms as a continuous variable the depressive interaction between depressive symptoms (hi/lo) and maternal sensitivity (insensitive/sensitive) will be significant. When examining depressive symptoms as a categorical variable, that is the chronicity of maternal depressive symptoms (never, sometimes, and chronically depressed) the toddlers of chronically

depressed mothers who are low in sensitivity will receive higher ratings on these measures. These children will differ significantly from the children of mothers who are chronically depressed, but also more sensitive. Similarly, maternal sensitivity may buffer the children whose mothers are depressed only sometimes.

2. METHOD

2.1. PARTICIPANTS

The sample for this study was comprised of 1189 mother-child dyads from diverse socioeconomic backgrounds who were a subset of those participating in an ongoing, multi-site study, the NICHD Study of Early Child Care. In 1991, 1364 families with a healthy 1-month-old infant (705 males, 659 females) were enrolled in the NICHD study. Mothers and infants were recruited from hospitals in Little Rock, AR; Irvine, CA; Lawrence, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton, NC; Seattle, WA; and Madison, WI. The recruited families were from diverse backgrounds: 24% of the participating children and families were ethnic minority, 14% of the mothers were single, and 11% of them did not have a high school degree. Families were excluded from the sample if: (1) the mother was under 18, (2) the mother was not conversant in English, (3) the family planned to move, (4) the child was hospitalized for more than 7 days following birth or had obvious disabilities, or (5) the mother had a known or acknowledged substance abuse problem.

Mothers and children from the NICHD sample were included in the current study if: (a) the mothers completed the Center for Epidemiological Studies Depression scale (CES-D) at least twice during the first two years of the study child's life, and (b) data on the relevant child outcomes were available. Mothers and children were excluded if they did not participate in the

24-month laboratory observation, or were missing relevant maternal report data. At least partial data were available for these analyses for 1189 mother-child dyads (609 males, 580 females).

Attrition analyses, comparing families who were not included in the analyses due to missing data with those who were included, revealed that based on the 1-month home visit women included in the study were more educated ($M = 14.37$ vs. 13.34 years of education, $F = 28.67$ & $p < .05$), had a higher average income-to-needs ratio ($M = 2.86$ vs. 2.1 , $F = 12.47$, $p < .05$), and were more likely to be living with a partner than those who were not included ($M = 86\%$ vs. 72% , $F = 26.52$, $p < .05$). These women also reported fewer depressive symptoms ($M = 9.66$ vs. 11.5 , $F = 11.31$, $p < .05$). Hence, the sample for the study is biased toward more resources and lower levels of depression, that is, toward better family functioning.

2.2. PROCEDURE

When the children were one month old, demographic information including mothers' education level, family's income-to-needs ratio (total annual income divided by the poverty threshold for that family's size), and mothers' marital status (whether single/married or partnered) was collected during a home visit. Maternal depressive symptoms were assessed with a brief self-report measure, the CES-D, when the children were 1, 6, 15, and 24 months old.

When the children were 24 months old (+ or – 2 months), each mother-child dyad was invited to the laboratory to participate in a series of structured activities and assessments. During the laboratory visit all the activities were videotaped through a one-way mirror. Each dyad participated in free play and a clean up task, and measures of non-compliance and negative affect

were obtained. In addition, the Bayley Test of Mental Development was administered to the child and non-compliance with the examiner was coded.

During the laboratory visit, mothers completed the Child Behavior Checklist (CBCL 2/3, Achenbach, Edelbrock, & Howell, 1987) to assess externalizing behavior and the Adaptive Social Behavior Inventory (ASBI, Hogan, Scott, & Bauer, 1992) to assess compliant and disruptive behavior.

2.3. MEASURES

2.3.1. Demographics

- (a) Maternal education: The number of years in school completed at the time of recruitment was used as an index of maternal education.
- (b) Proportion of time partnered at 24 months: Information about mother's partnered status was collected when the children were 1, 6, 15, and 24 months old. Proportion of time partnered reflects the proportion of times that mothers were partnered during the first two years of the child's life.
- (c) Average income-to-needs ratio: Information about family income and family size were collected during home visits when the children were 1, 6, 15, and 24 months old. The income-to-needs ratio was calculated as income, not including government payments, divided by the appropriate poverty threshold (U.S. Department of Labor, 1994) for each household size (NICHD Early Child Care Research Network, 1999a). Income-to-needs ratios were averaged across the four assessments during the first two years of the child's life to index the family's economic status.

2.3.2. Maternal measures

- (a) Maternal depressive symptoms: Maternal reports of depressive symptoms were assessed at 1, 6, 15, and 24 months with the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item scale that assesses depressive symptoms manifested in the past two weeks. Its reliability and validity have been well established. Mothers' scores on the CES-D correlated moderately over time with Pearson correlation coefficients ranging from .41 to .58. In addition, the Cronbach alphas were high at each assessment (range = .88 to .91).

The average of the CES-D scores at 1, 6, 15, and 24 months was used as an index of depressive symptoms over the first two years of the child's life. Those women who were missing three or four CES-D scores were not included in the analyses. However, if only one or two depression scores were missing, the average of the remaining scores was computed to index maternal depressive symptoms.

These scores indexing maternal depressive symptoms were further categorized into two groups (hi and lo) to test the interaction between maternal sensitivity (insensitive and sensitive) moderated the association between maternal depressive symptoms and child outcomes. Mothers who scored 16 or above were classified as 'hi' and the rest were classified as 'lo'. In line with the work of Radloff and others (NICHD ECCRN 1999b), a cutoff score of 16 or above was used to define potentially serious depression.

To examine the association between the chronicity of maternal depressive symptoms and child non-compliance, mothers were categorized as chronically depressed, sometimes depressed, or never depressed based on their CES-D scores over time. Mothers who scored 16 or above on the CES-D at three or four time points were

classified as chronically depressed; mothers who scored 16 or above at only one or two time points were classified as sometimes depressed; and mothers who never scored 16 or above at any of the four time points were classified as never depressed (see NICHD Early Child Care Research Network, 1999b). Cases were included in the analyses if the mothers possessed at least three CES-D scores. The average of their remaining three CES-D scores was used as an index of depressive symptoms for 103 cases where 24-month data were available for the children but mothers were missing one CES-D score. Five cases where the mothers were missing two CES-D scores but 24-month laboratory data were available for the children were also included. Two women who scored below 16 on the CES-D at both assessments were included in the never-depressed group. One woman who had one elevated score was included in the sometimes-depressed group. Two women with both scores elevated were considered chronically depressed.

- (b) Maternal sensitivity: Mother-child interaction was observed in the home at 6 and 15 months and in the laboratory at 24 months. At 6 and 15-month home visits, mother-child interactions were videotaped during 15 minutes of semi-structured play. At the 6-month visit, mothers played with their infants without any object or toy for about 7 minutes. For the remaining 8 minutes, mothers were given a standard set of toys which included a rattle with faces, a small activity center, a ball with animal forms, a rolling toy, a book with shapes and faces, and a stuffed animal (NICHD Early Child Care Research Network, 1999a). At the 15-month visit, mothers were asked to show their infants the contents of three containers in a set order. The first container had a storybook in it, the second contained a toy stove and related objects, and the third a toy house (Vandell, 1979). At the 24-month laboratory visit, mothers were instructed to have their toddlers

spend time with the toys in each of three boxes, beginning with box 1 and ending with box 3. Box 1 contained a picture book, *Barnyard Toys*, by Deborah Duffy. The toys in box 2 and 3 were the same as at the 15 month assessment: Box 2 contained a “toddler kitchen” with 4 accessories, and Box 3 contained a “discovery cottage” which included a small house with moveable parts, three figures, and a car.

The videotapes of mother-child interaction were sent to a central, non-data collection location for coding. Coders received training and ongoing supervision at regular meetings throughout the coding process. Coders were blind to the information about families and videotapes were randomly assigned to the coders (NICHD Early Child Care Research Network, 1999a).

Mothers’ behavior was rated on 4-point scales of sensitivity to non-distress, positive regard, and intrusiveness during free play. The scores ranged from 1 (not at all characteristic of the interaction) to 4 (highly characteristic of the interaction). The scores on the intrusiveness scale were reversed. At each age, the sum of the scores on the three scales (sensitivity to non-distress, positive regard, and intrusiveness) formed the composite score of maternal sensitivity during play. Intraclass correlations were used to calculate intercoder reliability on the composite scores. Reliabilities averaged across pairs of raters were .87 at 6 months, .83 at 15 months, and .85 at 24 months. Cronbach alphas were .75, .70, and .79, respectively (NICHD ECCRN, 1999b).

Maternal sensitivity was categorized into two groups: insensitive and sensitive to test the interaction between maternal sensitivity and depressive symptoms to examine whether maternal sensitivity moderated the association maternal depressive symptoms and child outcomes. One-third of the mothers whose sensitivity ratings were below 9.0

(maternal sensitivity scores ranged from 4.5 to 12.0, and $M = 9.3$) were classified as insensitive and the rest of the mothers were classified as sensitive.

2.3.3. Child Outcome measures

(a) Maternal reports:

- (i) Maternal reports of children's externalizing problems: Maternal reports of child behavior problems on the externalizing scale of the CBCL 2/3 (Achenbach, Edelbrock, & Howell, 1987) were obtained when the children were 24 months old. Mothers rated how characteristic each behavior was of the child over the past 2 months on 3-point scales (0 = not true, 1 = sometimes true, 2 = very true). Items assessing aggressive and destructive behavior make up the externalizing scale.

Table 1: Summary of Child Outcome Variables

Variables	Composites
Compliance during laboratory clean-up	Compliance – Assertive Non-Compliance - Passive Non-Compliance + Dyadic Cooperation
Compliance with the Bayley examiner	Child's willingness to attempt the task + Child's response to the examiner's request to give back the materials
Negative Affect and Disengagement during a semi-structured interaction with mother	Negative Mood + Activity Level - Sustained Attention
Maternal report of behavior problems	CBCL Externalizing Scale + ASBI Disrupt Scale
Maternal report of compliance	ASBI Comply Scale

Disrupt scale assesses resistant and agonistic behavior. The items are rated on 3-point scales for frequency of occurrence (1=rarely, 2=sometimes, and 3=almost always). In this sample the alpha coefficient for the Disrupt Scale is .60 at 24 months (NICHD Early Child Care Research Network, 1998b).

A composite externalizing problem score was formed by averaging the standard scores on maternal reports of child behavior problems from the Externalizing scale of the CBCL (Achenbach et al. 1987) and the Disrupt scale of the ASBI (Hogan et al. 1992) (see NICHD Early Child Care Research Network, 1998a).

- (ii) Maternal reports of children's compliant behavior: The Comply Scale of the Adaptive Social Behavior Inventory (ASBI; Hogan et al, 1992) was used to assess children's compliant behavior at 24 months. The 10-item Comply Scale taps prosocial engagement and cooperation. The alpha coefficient for the Comply Scale is .82 at 24 months. The sum of the scores on the 10 items of the ASBI-Comply Scale was used as an index of children's compliant behavior as reported by mothers.

(b) Laboratory Assessments at 24 months (Observed Compliance and Negative Mood)

Data were collected across the 10 sites by research assistants who were trained prior to the data collection. Each research assistant passed the relevant certification procedure before collecting the data at each time point. Certification procedures entailed a common certifier reviewing the videotapes of each research assistant administering the measures to subjects. The certification procedures

were designed to ensure standardized data collection across the 10 sites (NICHD Early Child Care Research Network, 1998b).

- (i) Compliance during the laboratory clean up task: In the laboratory each mother-child dyad engaged in free play. At the end of the 15 minute toy-play period, the research assistant handed the mother containers for the toys and instructed her to have the child participate in picking up the toys; no other directions were given to the mother. The child and the mother were videotaped for the next 5 minutes or until all toys had been placed in the containers (NICHD Early Child Care Research Network, 1998b).

Coders who were blind to mother's sensitivity and depression status, as well as any other information about study children and families, coded the videotapes for child's compliance during the clean-up task. Child behavior was rated on 5 point global scales developed for this study (1 = not at all characteristic to 5 = very characteristic). Compliance and three forms of non-compliant behavior: assertive non-compliance (e.g., saying "no"), passive non-compliance (e.g., ignoring), and defiance (e.g., angry behavior, doing opposite of request) were rated in reference to general or explicit directions from the mother. Dyadic cooperation was also rated on a single 5-point scale to capture the extent of mutuality, cooperation, reciprocity, and smoothness of interaction between mother and child. Reliability of these ratings at 24 months was determined using intraclass correlations according to the procedures outlined by Winer (1971), yielding estimates of .92 for compliance, .84 for assertive noncompliance, .86 for passive noncompliance, .82 for defiance, and .91 for dyadic cooperation (NICHD

Early Child care Research Network, 1998b). A score of compliance during lab clean-up was obtained by summing the scores of compliance, dyadic cooperation, assertive non-compliance reversed, and passive non-compliance reversed (NICHD Early Child Care Research Network, 1998b).

- (ii) Compliance with Bayley Examiner: Children's compliance with an unfamiliar adult, the Bayley examiner in this case, was observed in the laboratory at 24 months. The examiner first made a verbal request without accompanying gestures ("It's time to clean up; please give me the TOY"), waited for 10 seconds, and then made a second request if necessary. If the child did not comply after two requests, the examiner continued with the next item. Due to wide individual differences in items administered during the Bayley test as well as differences in pacing and order of administration, the administration of several items (blue shape board, pegboard, crayon/paper, nesting cups, stacking cubes, train of cubes) were standardized to assess compliance with the examiner at 24 months.

Compliance was assessed for both the child's willingness to attempt the task and the child's response to the request to give back the materials. Children were scored by the Bayley examiner separately for the two types of compliance. The child did not need to succeed on the task to be scored as compliant; efforts made to perform the requested act were considered evidence of compliance with the examiner. Each child scored either a 0 (did not comply) or 1 (complied) on the binary rating scales for both categories of compliance, the child's willingness to attempt the task and the child's response to the request to give back the materials.

A total compliance score was obtained by summing the scores for these items (NICHD Early Child Care Research Network, 1998b).

(iii)Negative mood during the three boxes interaction procedure: At 24 months, child behavior and negative affect were rated during interaction with mother in the semi-structured play described under the assessment of maternal sensitivity.

Ratings of the child's negative mood, activity level, and sustained attention were made using global 4-point scales (1 = uncharacteristic to 4 = characteristic). Winer (1971) estimates of interrater reliability were .69 for the scales measuring activity level and sustained attention, and .73 for the mood scale (NICHD Early Child Care Research Network, 1998b). A composite of child's negative mood and disengagement was formed by summing scores of negative affect, activity level, and sustained attention reversed.

3. RESULT

3.1. PRELIMINARY ANALYSES

To examine the validity of the construct of self-regulation inter-correlations among non-compliance, displays of negative affect and disengagement, and externalizing problems was conducted. As can be seen in Table 2, all the child outcome variables were correlated with each other in the predicted directions. Maternal reports were correlated with observational measures. Specifically, maternal report of ASBI compliance was correlated with both observational measures of child compliance. Moreover, compliance during lab clean-up with mother was correlated with compliance with the Bayley examiner.

In order to control for the demographic variables (child sex, maternal education, family's income-to-needs ratio, and % of time mothers were partnered until the child was 24 months old) that might be associated with both the maternal depressive symptoms and child outcome measures (compliance during lab cleanup, compliance with the Bayley examiner, negative affect disengagement during semi-structured play interaction, and maternal reports of externalizing problems and ASBI compliance) correlations between demographics and maternal depressive symptoms and between demographics and child outcomes were examined. In addition, associations between demographics and maternal sensitivity were also examined. Table 3 presents a summary of these associations, as well as descriptive statistics on major study variables.

Table 2: Zero-order correlations between child outcome variables

	compliance during lab clean-up	compliance with the Bayley examiner	negative affect and disengagement during semi-structured play	maternal reports of externalizing problems	maternal reports of ASBI compliance
compliance during lab cleanup	1	0.251**	-0.089**	-0.107**	0.124**
compliance with the Bayley examiner		1	-0.192**	-0.185**	0.230**
negative Affect and disengagement during semi-structured play			1	0.157**	-0.165**
maternal reports of externalizing problems				1	-0.524**
maternal reports of ASBI compliance					1

*p<.05, **p<.01, ***p<.001

3.1.1. Maternal depressive symptoms and demographics

Maternal depressive symptoms were negatively correlated with maternal education, average income to needs ratio, and proportion of time mothers were partnered during the first two years of child's life such that mothers with higher depressive symptoms had fewer years of education, came from families with lower income to needs ratios and were less likely to be partnered.

3.1.2. Child outcomes and demographics

All child outcome measures, except compliance during lab clean-up, were associated with the demographic variables. Specifically, compliance with the Bayley examiner and maternal reports of ASBI compliance were positively correlated with maternal education, average income-to-needs ratios of the families and, the proportion of time mothers were partnered during the first two years of child's life. In addition, girls were more compliant with the Bayley examiner than were boys, and they were rated as more compliant on the ASBI.

Table 3: Zero-order correlations and descriptive statistics for demographic variables, maternal depression, maternal sensitivity, and child

	compliance during lab cleanup	compliance with Bayley examiner	negative affect and disengagement during free play	maternal reports of behavior problems	maternal reports of ASBI compliance	maternal depression	maternal sensitivity
Child's gender	0.039	0.112**	-0.004	-0.038	0.094**	0.001	0.074*
Maternal education	0.046	0.237**	-0.073*	-0.209**	0.199**	-0.301**	0.482**
average income-to-needs ratio	0.019	0.186**	-0.054	-0.182**	0.175**	-0.284**	0.407**
proportion of time partnered	0.057	0.188**	-0.072*	-0.176**	0.134**	-0.236**	0.348**
maternal depression	-0.042	-0.143**	0.092**	0.352**	-0.294**	1	-0.319**
maternal sensitivity	0.063**	0.299**	-0.230**	-0.224**	0.280**	-0.319**	1
N	1165	1061	1170	1178	1189	1189	1180
Mean	5.36	7.61	1.18	24.66	22.18	9.67	9.34
Standard Deviation	3.29	1.53	1.43	8.49	3.45	6.78	1.31
Range	-5.0 to 8.0	2.0 to 9.0	-2.0 to 7.0	7.0 to 56.0	10.0 to 30.0	0 to 41.5	4.5 to 12.0

*p<.05, **p<.01, ***p<.001

Negative affect/disengagement during the semi-structured play interaction and maternal reports of externalizing problems were negatively correlated with maternal education and proportion of time mothers were partnered; children of mothers who had more years of education and were more likely to be partnered were less negative and more engaged with mothers during free play and were rated by their mothers as less problematic. In addition, maternal reports of externalizing problems were negatively correlated with the income to needs ratio.

3.1.3. Maternal sensitivity and demographics

Maternal sensitivity also was associated with child gender, maternal education, average income-to-needs ratios, and the proportion of time mothers were partnered. Specifically, mothers with more years of education, with higher income-to-needs ratios, and who were more likely to be

partnered were more sensitive when observed with their children during play. Mothers also were significantly more sensitive with their daughters than sons.

3.2. DEPRESSIVE SYMPTOMS AS A CONTINUOUS VARIABLE

3.2.1. Maternal sensitivity as a mediator

A series of regressions was conducted to examine whether maternal sensitivity mediated the association between maternal depressive symptoms and child outcomes. Figure 1 depicts this mediational model. In the first step, the association between maternal depressive symptoms and each child outcome was examined to establish path A. Path B represents the next step where the association between maternal depressive symptoms and maternal sensitivity was established. Path C represents the associations between maternal sensitivity and child outcomes which were examined in the subsequent step. Finally, path D which represents maternal sensitivity as a mediator of the association between depressive symptoms and child outcome was examined when paths A, B, and C were significant. Regression analyses were conducted to determine whether controlling for maternal sensitivity significantly attenuated the association between maternal depressive symptoms and the relevant child outcome.

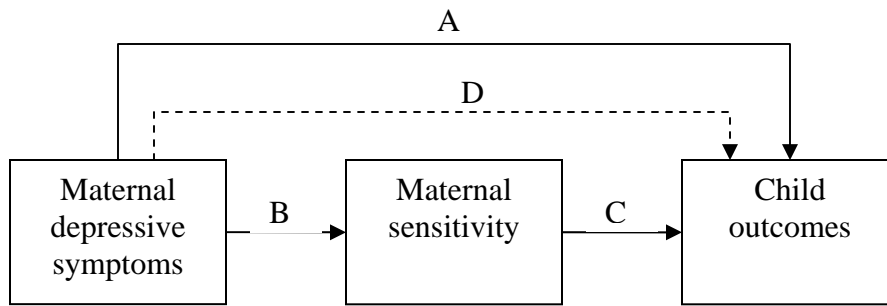


Figure 1: Mediation model (role of maternal sensitivity as a mediator of the association between maternal depressive symptoms and child outcomes)

3.2.1.1. Maternal depressive symptoms and child outcomes (Path A)

Maternal depressive symptoms were significantly correlated with four out of five child outcome measures. As can be seen in Table 3, children of mothers with higher depressive symptoms were more negative and less engaged during semi-structured play, and they were less compliant with the Bayley examiner. They were also rated by their mothers as exhibiting more behavior problems on the externalizing scale and as less compliant on the ASBI scale. Maternal depressive symptoms were not associated with compliance during lab clean-up.

3.2.1.2. Maternal depressive symptoms and maternal sensitivity (Path B)

Maternal depressive symptoms were negatively associated with maternal sensitivity such that mothers with more depressive symptoms were less sensitive with their children than mothers with fewer symptoms.

3.2.1.3. Maternal sensitivity and child outcomes (Path C)

Maternal sensitivity was associated with all five outcomes in the expected direction. As can be seen in Table 3, children of mothers who were more sensitive were also observed to be more

compliant across situations, including both lab clean-up and with the Bayley examiner, than were the children of mothers who were less sensitive. More sensitive mothers also rated their children as more compliant on the ASBI scale.

Maternal sensitivity was negatively associated with displays of negative affect and disengagement during the semi-structured play interaction and with maternal reports of externalizing problems. Children of mothers who were more sensitive were less negative and more engaged with their mothers during semi-structured play and they were rated by their mothers as exhibiting fewer externalizing problems than were children whose mothers were less sensitive.

3.2.1.4. Result of regression analyses testing the mediational model

The following results present predictors of child outcomes after controlling for the demographics and whether maternal sensitivity mediated the association between maternal depressive symptoms and child outcomes.

(a) Compliance during lab clean-up

Compliance during lab clean-up task was not found to be significantly associated with either the demographic variables or maternal depressive symptoms, so it is not considered further in these analyses.

(b) Compliance with the Bayley examiner

Multiple regression analyses were conducted next, controlling for significant demographic variables. Maternal education and proportion of time mothers were partnered were both significant predictors of compliance with the Bayley examiner, together accounting for 7.4% of the variance. Maternal depressive symptoms were no longer a significant predictor with covariates in the model. Maternal sensitivity, however,

continued to predict child compliance, accounting for 3.3% of the variance after controlling for the demographic variables. Data are summarized in Table 4.

Table 4: Summary of regression analyses predicting compliance with the Bayley examiner

compliance with the Bayley examiner				
variable	beta	t	cum R	R sq ch
demographics			0.272	0.074***
maternal education	0.170	4.708***		
ave income/needs	0.037	1.009		
% time partnered	0.115	3.584***		
maternal depression	-0.053	-1.667	0.276	0.002
N=1058 for the Bayley Test				
*p<.05, **p<.01, ***p<.001				

(c) *Negative affect and disengagement during semi-structured play*

In the multiple regression analyses, demographic variables were not significant predictors of displays of negative affect and disengagement during the semi-structured play interaction, but maternal depressive symptoms were, accounting for 0.4% of the variance (see Table 5). With maternal sensitivity in the model, however, maternal depressive symptoms were no longer a significant predictor of negative affect, indicating that maternal sensitivity mediated the association between maternal depressive symptoms and negative affect and disengagement during semi-structured play. Maternal sensitivity accounted for 4.8% of the variance after controlling for the demographic variables.

(d) *Maternal reports of externalizing problems*

The regressions examining maternal reports of externalizing problems are summarized in Table 6. Maternal education and proportion of time partnered were significant predictors of maternal reports of children's externalizing problems accounting for 6.1% of the

variance. Maternal depressive symptoms also predicted maternal reports of children's externalizing problems, accounting for an additional 8.0% of the variance. Maternal sensitivity was also a significant predictor. However, it accounted for only 1.2% of the variance with these variables in the model; maternal depressive symptoms continued to account for 7.3% of the variance, suggesting that it shared variance with maternal sensitivity and that sensitivity did not account for the link between maternal depressive symptoms and maternal reports of externalizing problems.

(e) *Maternal reports of ASBI compliance*

In the regressions summarized in Table 7, child gender, maternal education, average income-to-needs ratio, and proportion of time mothers were partnered were all significant predictors of maternal reports of ASBI compliance, accounting for 5.0% of the variance. Maternal depressive symptoms also were unique predictors of ASBI compliance ratings, accounting for an additional 5.4% of the variance. Although, maternal sensitivity was also a significant predictor contributing 3.6% of the variance, maternal depressive symptoms continued to account for a significant 4.5%, suggesting additive effects rather than mediation. Together, maternal sensitivity and maternal depressive symptoms accounted for 8% of the variance in maternal ratings of compliance.

Table 5: Summary of regression analyses predicting negative affect and disengagement

Negative Affect & Disengagement				
variable	beta	t	cum R	R sq ch
demographics			0.091	0.008**
maternal education	-0.040	-1.266		
% time partnered	-0.044	-1.424		
maternal depression	0.070	2.264*	0.112	0.004*
demographics			0.086	0.007*
maternal education	0.059	1.763		
% time partnered	0.009	0.299		
maternal sensitivity	-0.253	-7.397***	0.235	0.048***
maternal depression	0.029	0.936	0.237	0.001
N=1167 for the 3 Boxes task/Semi-Structured Play				
*p<.05, **p<.01, ***p<.001				

Table 6: Summary of regression analyses predicting maternal reports of externalizing

maternal reports of behavior problems				
variable	beta	t	cum R	R sq ch
demographics			0.247	0.061***
maternal education	-0.086	-2.615**		
average income/needs	-0.027	-0.810		
% time partnered	-0.068	-2.306*		
maternal depression	0.302	10.439***	0.375	0.080***
demographics			0.245	0.060***
maternal education	0.292	-1.672		
average income/needs	-0.016	-0.463		
% time partnered	-0.058	-1.924		
maternal sensitivity	-0.079	-2.411*	0.269	0.012***
maternal depression	0.292	9.935***	0.381	0.073***
N=1166 for maternal reports of behavior problems				
*p<.05, **p<.01, ***p<.001				

Table 7: Summary of regression analyses predicting maternal report of ASBI

maternal reports of ASBI compliance				
variable	beta	t	cum R	R sq ch
demographics			0.223	0.050***
maternal education	0.092	2.751**		
ave income/needs	0.043	1.272		
% time partnered	0.032	1.063		
maternal depression	-0.248	-8.408***	0.322	0.054***
demographics			0.223	0.050***
maternal education	0.03	0.864		
ave income/needs	0.015	0.436		
% time partnered	0.005	0.154		
maternal sensitivity	0.185	5.635***	0.293	0.036***
maternal depression	-0.23	-7.799***	0.362	0.045***

N=1177 for maternal reports of ASBI compliance

*p<.05, **p<.01, ***p<.001

3.2.2. Maternal sensitivity as a moderator

Regression analyses were conducted to examine whether maternal sensitivity moderated the association between maternal depressive symptoms and child outcomes. The interaction between maternal sensitivity and maternal depressive symptoms was tested with demographics, maternal sensitivity, and maternal depressive symptoms in the model. The interaction between maternal sensitivity and maternal depressive symptoms was not significant for any of the child outcomes indicating that maternal sensitivity did not influence the nature of the association between maternal depressive symptoms and child outcomes.

3.3. CHRONICITY OF DEPRESSIVE SYMPTOMS

Table 8 presents descriptive statistics on the chronicity of depressive symptoms by child outcome variables. A series of ANCOVAS was conducted to examine whether the chronicity of maternal depressive symptoms was associated with child outcomes and whether maternal sensitivity mediated as well as moderated these associations. In the first step, the association between the chronicity of maternal depressive symptoms (never, sometimes, and chronic) and child outcomes was established. Next, an ANCOVA was performed to examine whether chronicity of depressive symptoms was associated with maternal sensitivity. In the subsequent step, the association between maternal sensitivity and child outcomes was examined. Finally, analyses were performed to examine whether the presence of maternal sensitivity in the model significantly attenuated the association between the chronicity of maternal depressive symptoms and child outcomes. All analyses were conducted after controlling for the demographic variables which were significantly associated with both the chronicity of maternal depressive symptoms and child outcomes. Also, all significant F tests were followed up with post-hoc analyses.

In addition, 2x3 ANCOVAS were performed to determine whether maternal sensitivity moderated the association between the chronicity of depressive symptoms and child outcomes. Specifically, the interaction between maternal sensitivity (Insensitive/Sensitive) and the chronicity of maternal depressive symptoms (never, sometimes, and chronic) was examined for each outcome.

Table 8: N, means, and standard deviations for the chronicity of depressive symptoms by child outcomes

child outcomes	never depressed			sometimes depressed			chronically depressed			Total N
	N	Means	SD	N	Means	SD	N	Means	SD	
compliance during lab clean-up	675	5.44	3.2	436	5.27	3.3	54	5.03	3.34	1165
compliance with the Bayley examiner	618	7.72	1.5	397	7.48	1.6	46	7.11	1.7	1061
negative affect and disengagement during semi-structured play	677	1.10	1.4	438	1.25	1.5	55	1.56	1.5	1170
maternal reports of externalizing problems	680	22.83	7.8	444	26.6	8.5	54	31.7	9.5	1178
maternal reports of ASBI compliance	686	22.86	3.4	449	21.35	3.3	54	22.18	3.4	1189

3.3.1. Chronicity of depressive symptoms and child outcomes

After controlling for the significant demographic variables the chronicity of maternal depressive symptoms was not significantly associated with the observational measures: compliance during the lab clean up task ($F=0.22$, n.s.), compliance with the Bayley examiner ($F=0.42$, n.s.), and display of negative affect and disengagement during the semi-structured play ($F=1.99$, n.s.). Hence, contrary to expectations, compared to the children of mothers who were never depressed or were depressed sometimes children of mothers with chronic depressive symptoms were not significantly less compliant during the lab clean-up task or with the Bayley examiner, they were not more negative with their mother during the semi- structured play.

However, Table 9 and Table 10 respectively indicate that the chronicity of maternal depressive symptoms was significantly associated with maternal reports of externalizing problems ($F=30.81$, $p<0.05$) and maternal reports of compliance on the ASBI scale ($F=21.25$, $p<0.05$) after controlling for the demographic variables. Follow up analyses revealed that children of mothers who were never depressed were rated significantly lower on externalizing

problems and higher on compliance compared to children of mothers who were chronically depressed or depressed only some of the time. Please refer to Table 11 for a summary of the estimated marginal means of the three depression groups.

Table 9: Summary of analyses of covariance examining the role of maternal sensitivity as a potential mediator of the association between the chronicity of depressive symptoms and maternal reports of externalizing behavior problems

Maternal reports of behavior problems			
source	df	F	p
intercept	1	482.76	0.000
maternal education	1	11.21	0.001
ave income/needs	1	1.29	0.257
% time partnered	1	7.35	0.007
chronicity of dep Sx	2	30.81	0.000
error	1169		
total	1175		
intercept	1	389.23	0.000
maternal education	1	7.08	0.000
ave income/needs	1	1.65	0.200
% time partnered	1	7.82	0.005
maternal sensitivity	1	15.08	0.000
error	1161		
total	1166		
intercept	1	356.77	0.000
maternal education	1	4.95	0.026
ave income/needs	1	0.53	0.468
% time partnered	1	4.93	0.027
maternal sensitivity	1	8.07	0.005
chronicity of dep Sx	2	27.58	0.000
error	1159		
total	1166		

Since maternal depressive symptoms were not significantly associated with the observational measures of compliance or with the display of negative affect and disengagement during play these outcomes were not considered in further analyses.

3.3.2. Chronicity of depressive symptoms and maternal sensitivity

The chronicity of maternal depressive symptoms was significantly associated with maternal sensitivity ($F=13.4$, $p<0.05$) such that mothers who were never depressed were significantly more sensitive with their children than mothers who were depressed sometimes or chronically (Means: never depressed=9.64, depressed sometimes=8.99, chronically depressed=8.47).

3.3.3. Maternal sensitivity and child outcomes

Maternal sensitivity also was significantly associated with maternal reports of externalizing problems ($F=15.08$, $p<0.05$, see Table 7) and compliance on the ASBI scale ($F=46.24$, $p<0.05$, see Table 8). Children of mothers who were less sensitive were rated by their mothers as exhibiting more externalizing behavior problems and as less compliant on the ASBI scale.

3.3.4. Role of maternal sensitivity as a potential mediator

As noted above the chronicity of depressive symptoms and maternal sensitivity both were significant predictors of maternal reports of externalizing problems and compliance. However, as can be seen in Table 7 and Table 8, the presence of maternal sensitivity in the model did not significantly attenuate the association between chronicity of maternal depressive symptoms and maternal reports of externalizing problems or compliance. Therefore, maternal sensitivity did not mediate the association between the chronicity of depressive symptoms and maternal reports. These results are consistent with regression analyses.

3.3.5. Maternal sensitivity as a potential moderator

To examine the role of maternal sensitivity as a potential moderator of the association between chronicity of maternal depressive symptoms and maternal reports, maternal sensitivity was

categorized into two groups to examine the interaction between chronicity and sensitivity. Mothers with sensitivity scores in the bottom third of the range of scores were labeled as insensitive and all others were labeled as sensitive. Consistent with prior analyses, main effects were found, but no interaction between chronicity and sensitivity was evident. Thus there was no support for moderation.

Table 10: Summary of analyses of covariance examining the role of maternal sensitivity as a potential mediator of the association between the chronicity of depressive symptoms and maternal reports of ASBI compliance

Maternal reports of ASBI compliance			
source	df	F	p
intercept	1	849.79	0.000
maternal education	1	11.19	0.001
ave income/needs	1	2.39	0.123
% time partnered	1	1.88	0.171
chronicity of dep Sx	2	21.25	0.000
error	1180		
total	1186		
intercept	1	344.55	0.000
maternal education	1	2.92	0.088
ave income/needs	1	1.26	0.263
% time partnered	1	0.79	0.375
maternal sensitivity	1	46.24	0.000
error	1172		
total	1177		
intercept	1	376.53	0.000
maternal education	1	1.73	0.189
ave income/needs	1	0.45	0.504
% time partnered	1	0.14	0.706
maternal sensitivity	1	35.19	0.000
chronicity of dep Sx	2	17.72	0.000
error	1170		
total	1177		

Table 11: Estimated marginal means for the chronicity of depressive symptoms and maternal sensitivity predicting child outcomes after controlling for the demographics variables.

predictors	outcomes				
	compliance during lab clean-up	compliance with the Bayley examiner	negative affect and disengagement during semi-structured play	maternal reports of behavior problems	maternal reports of ASBI compliance
chronicity of depression					
never	5.42	7.63	1.12	23.21	22.73
sometimes	5.32	7.59	1.23	26.18	21.52
chronic	5.16	7.43	1.49	30.61	20.79
maternal sensitivity					
insensitive				25.88	21.23
sensitive				24.15	22.59

4. DISCUSSION

This study examined the associations between maternal depressive symptoms and children's self-regulation including compliance, negative affect and externalizing problems in toddlerhood. In addition, maternal sensitivity was examined as a possible mediator or moderator of these associations. The effects of the chronicity of depressive symptoms on child outcomes were explored by categorizing the continuous measure of depressive symptoms into three depression groups (never, sometimes, and chronic). All associations were examined before and after taking into account the effects of demographic variables.

Maternal depressive symptoms were associated with most of the components of self-regulation measured in this study. In addition, maternal sensitivity was associated with most measures of self-regulation and with maternal depressive symptoms. Despite this, there was only minimal support for maternal sensitivity as a mediator of the link between maternal depressive symptoms and child outcomes. When chronicity of depressive symptoms was examined as a categorical variable, results were generally consistent with the findings obtained when depressive symptoms were analyzed as a continuous measure. In addition, no evidence was found to support the hypothesis that maternal sensitivity would moderate depression effects.

Consistent with expectations, however, children of mothers experiencing depressive symptoms were less compliant with the Bayley examiner, more negative and disengaged during free play, and rated by their mothers as exhibiting more externalizing problems and as less compliant. These results are consistent with the larger literature (Cummings, Davies, &

Campbell, 2000; Cummings & Davies, 1994; Downey & Coyne, 1990; Gelfand & Teti, 1990) on maternal depression which suggests that depressive symptoms are associated with negative child outcomes. Maternal depressive symptoms were not correlated with observed compliance during lab clean-up, possibly because this is a less robust measure. Compliance with maternal requests to clean up toys was assessed during a brief interaction and most children were observed to be compliant. In this activity, children received undivided attention from their mothers and perhaps this was not stressful for children and did not provide much opportunity for negative behaviors.

Because, in general, maternal education, family income, and the presence of a partner in the household, were associated with maternal depression, maternal sensitivity, and some child outcomes, analyses were repeated controlling for relevant demographic variables. With demographic variables controlled, maternal depressive symptoms were no longer associated with compliance with the Bayley examiner. Instead, maternal education and the proportion of time mothers were partnered accounted for this relationship. Perhaps this is because children of mothers' with lower education and less partner support provide their children with fewer opportunities to participate in structured cognitive tasks or their children have less exposure to adults in teaching contexts. It may also be noted that the sample size for compliance with the Bayley examiner is lower than that for other child outcomes. Mothers of children, who do not have data on compliance with the Bayley examiner, were significantly more depressed, less educated, were partnered less frequently, and had lower family income than the mothers of children whose data is available.

The remaining associations were attenuated with demographic variables controlled, but maternal depressive symptoms were still significantly correlated with observed negative affect during play and maternal reports of compliance and externalizing problems. These results

indicate that depressed mothers may have more difficulty dealing with the demands of toddlerhood and that they may also see their children more negatively. Conversely, children with depressed mothers may indeed be somewhat less manageable. There is some disagreement in the literature about how to interpret questionnaire data obtained from mothers who are experiencing depressive symptoms. While some (Richters, 1992; Richters & Pellegrini, 1989) argue in favor of the accuracy of maternal reports, others (Webster-Stratton & Hammond, 1988; Friedlander, Weiss, & Traylor, 1986; Shaughency & Lahey, 1985) believe that depressive symptoms may bias a mother's impressions of her child's behavior. This makes it difficult to interpret the results. It cannot be said with certainty that children who are viewed by their mother's as less compliant and as exhibiting externalizing problems are significantly more problematic compared with children of never depressed mothers. To gain a better understanding of the seriousness of children's behavior problems it may be very useful to gather information from other sources. With older children there is an increased tendency to use teacher's reports in addition to parental reports. However, acquiring impressions of toddlers from other sources (such as alternate caregivers) becomes complicated, as there may not be one specific category of alternative informant across all toddlers.

Although reports from depressed mothers are sometimes considered to be biased, in real life mothers' interactions with their children are influenced by their perceptions of the child. Whether or not the child manifests problems, if the mother perceives her child to be hard to manage it is likely to influence her behavior toward her child such that a depressed mother might be more punitive and controlling toward her child or may withdraw from the interactions more easily, or may fluctuate between the two.

Although, depressive symptoms accounted for a small proportion of the variance after controlling for the demographics, these results suggest that mother's psychopathology may have a direct effect on children's regulatory skills. However, we expected that more proximal factors, such as maternal sensitivity, would better account for these associations. In the current study maternal depressive symptoms and maternal sensitivity were negatively associated, consistent with the literature (Cummings, Davies, & Campbell, 2000; Rutter, 2000) as well as other analyses of this dataset (NICHD Early Child Care Research Network, 1999). This is consistent with the idea that mothers experiencing depressive symptoms such as dysphoria, withdrawal, disengagement, anger, or irritability may find it somewhat more difficult to respond with warmth and sensitivity towards their children.

Maternal sensitivity was associated with all five child outcomes. Children of mothers who were more sensitive were more compliant with the Bayley examiner and they were less negative and more involved with their mothers during free play. More sensitive mothers also rated their children as exhibiting fewer externalizing problems and as more compliant. Although these associations were only modest, they underscore a consistent connection between a mother's behavior and her toddler's ability to self-regulate. However, these data do not shed light on the direction of effects. Sensitive parenting may elicit compliance and other positive responses from children; or conversely, children who are better able to self-regulate may elicit more sensitivity from mothers, whereas, those who are poor at self-regulation may make it more difficult for mothers to respond with more warmth and sensitivity, even during play. Thus it may well be that mothers were responding with warmth and sensitivity toward children who were more compliant, exhibited fewer externalizing problems, and were less negative and disengaged.

Given the associations discussed so far, it was also expected that sensitivity would mediate the relationship between depressive symptoms and child outcomes. Maternal sensitivity only accounted for the association between depressive symptoms and negative affect and disengagement during free play with mothers. Although statistically significant this may not be a very meaningful effect. The strength of the association between maternal depressive symptoms and negative affect and disengagement decreased when maternal sensitivity entered the equation, but the link between depressive symptoms and negative affect and disengagement was already quite weak. Depressive symptoms accounted for only 0.4% of the variance before maternal sensitivity was taken into account. Contrary to expectation, maternal sensitivity did not account for links between maternal depressive symptoms and ratings of child behavior. Maternal depressive symptoms and maternal sensitivity emerged as unique predictors, contributing independent variance to maternal reports. This has implications for intervention. To improve the quality of mother-child interactions intervention efforts may focus not only on mothers who are experiencing depressive symptoms but also target mothers who find it difficult to respond to their child with warmth and sensitivity.

Maternal sensitivity did not moderate the association between maternal depressive symptoms and child outcomes, indicating that irrespective of how sensitive the mothers were toward their child, depressive symptoms were related to child compliance, negative affect, and ratings of externalizing problems.

Chronicity of depressive symptoms

One would expect that chronic and severe depressive symptoms would have an impact on mothers' parenting skills and would in turn have an influence on children's self-regulation and autonomy in toddlerhood. Surprisingly, this study did not provide much support for differences

in child behavior as a function of the chronicity of depressive symptoms. The chronicity of depressive symptoms was related only to maternal reports and not to any of the observational measures of compliance and negative affect. In addition, consistent with the previous results from the analyses of symptoms as a continuous measure, maternal sensitivity and maternal depressive symptoms were both unique predictors of maternal reports. No support was observed for maternal sensitivity as a moderator.

One should bear in mind that the sample for this study, although large, was biased toward lower depression and more resources, that is, toward better family functioning. Therefore, some of the effects observed earlier may have been lost when depression groups were formed. Also, the question arises as to how severe and chronic the depressive symptoms have to be to compromise mothers' parenting skills and render them less sensitive and inadequate to the demands of parenting.

Although maternal depressive symptoms were not consistently associated with the child outcomes, all the child outcomes were inter-correlated in predicted ways, which supports the validity of the construct of self-regulation in this study. It is noteworthy that, maternal reports were correlated with observational measures. Specifically interesting is that, maternal reports of ASBI compliance was correlated with both compliance during lab clean-up and compliance with the Bayley examiner. This indicates that, while the observational measures may not have been robust enough, they were valid measures of child non-compliance and negative affect and disengagement. Moreover, compliance during lab clean-up was correlated with compliance with the Bayley examiner, which supports the notion that child's learning in one situation, that is, during interactions with mother does extend to interactions with other individuals.

4.1. LIMITATIONS AND FUTURE DIRECTIONS

Although this study had a large and diverse sample it was a community sample of women who had reported their depressive symptoms on questionnaire measures. It is likely that many of the most depressed mothers were not experiencing severe enough symptoms to meet clinical criteria or to seek treatment. As a result, the parenting ability of these mothers may not have been seriously impaired by their depressive symptoms which may have been more likely if the depressive symptoms were more severe. These questions, if examined in a large sample of women with clinically diagnosed depression may provide a better picture of the self-regulatory abilities of children of depressed versus non-depressed mothers.

In general, the sample of this study was also biased toward better family functioning, not only with respect to the severity of mothers' depressive symptoms but also with respect to maternal education level, socioeconomic status of the families', and partnered status of the mothers. Hence, the results of this study may not be generalizable to a sample of families at higher socio-economic risk. A sample with wider differences in the levels of socioeconomic functioning may be needed to identify the combined effects of depressive symptoms and other risk factors on the development of self-regulatory ability in toddlerhood.

Furthermore, some of the measures of mother-child interactions used in this study were very brief observations conducted in the laboratory and so may not have been robust enough. The measures perhaps did not put enough stress on either the mother or the child and hence may not have been able to capture the real quality of the dyadic relationship. Longer observations of mother-child interactions in more natural settings and in a wider variety of contexts may provide a better indication of the quality of mother child relationship.

Overall, the results indicate that the development of self-regulatory abilities in toddlerhood is rather complex, with several factors influencing maternal parenting behaviors. To gain a better understanding of the association between maternal depressive symptoms and children's regulation of behavior and affect further research is warranted, examining other aspects of maternal parenting skills, especially when mothers are suffering from a debilitating psychopathology such as depression. For example, maternal control strategies, child rearing techniques, child rearing beliefs, and perceived self-efficacy as a parent are some factors which were not investigated in this study but may be worthwhile to examine as potential mediators of the relation between maternal depressive symptoms and self-regulatory abilities in toddlerhood. Moreover, to obtain a complete picture of the quality of mother-child relationship child characteristics need to be taken into account as well. In addition, one needs to examine the presence of buffering agents. It may be the case that other family members may have been involved in children's caregiving and may have acted as buffers especially in cases where the mothers were experiencing depression.

BIBLIOGRAPHY

- Achenbach, T. M., Edelbrock, C., & Howell, C. T. (1987). Empirically based assessment of the behavioral/emotional problems of 2- and 3-year old children. *Journal of Abnormal Child Psychology*, 15, 629-650.
- Belsky, J., Woodworth, S., & Crnic, K. (1996). Trouble in the second year: Three questions about family interaction. *Child Development*, 67, 556-578.
- Campbell, S. B., Cohn, J. F., & Meyers, T. (1995). Depression in first-time mothers: mother-infant interaction and depression chronicity. *Developmental Psychology*, 31, 349-357.
- Cohn, J. F. & Campbell, S. B. (1992). Influence of maternal depression on infant affect regulation. In D. Cicchetti & S. Toth (Eds.), *Rochester Symposium on Developmental Psychopathology: Vol 4. A developmental approach to affective disorders* (pp. 103-130). Rochester, NY: University of Rochester Press.
- Cohn, J. F., Matias, R., Tronick, E. Z., Connell, D., & Lyons-Ruth, K. (1986). Face-to-face interactions of depressed mothers and their infants. In T. Field & E. Z. Tronick (Eds.), *Maternal depression and child disturbance: New directions for child development* (Vol. 34, pp. 31-46). San Francisco: Jossey-Bass.
- Cox, A. D., Puckering, C., Pound, A., & Mills, M. (1987). The impact of maternal depression in young children. *Journal of Child Psychology and Psychiatry*, 28, 917-928.
- Crockenberg, S., & Litman, C. (1990). Autonomy as competence in 2-Year-Olds: Maternal correlates of child defiance, compliance, and self-assertion. *Developmental Psychology*, 26, 961-971.
- Cummings, E. M., & Davies, P. T. (1994). Maternal depression and child development. *Journal of Child Psychology and Psychiatry*, 35, 73-112.
- Cummings, M. E., Davies, P. T., & Campbell, S. B. (2000). *Developmental Psychopathology and Family Process: Theory, Research, and Clinical Implications*. New York, NY: The Guilford Press.

- Dodge, K. A. (1990). Developmental psychopathology in children of depressed mothers. *Developmental Psychology*, 26, 3-6.
- Downey, G., & Coyne, J. C., (1990). Children of depressed parents: an integrative review. *Psychological Bulletin*, 108, 50-76.
- Friedlander, S., Weiss, D. S., & Traylor, J. (1986). Assessing the influence of maternal depression on the validity of the child behavior Checklist. *Journal of Abnormal Child Psychology*, 14, 123-133.
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Annual Psychology Review*, 10, 329-353.
- Hogan, A. E., Scott, & Bauer, C. R. (1992). The Adaptive Social Behavior Inventory (ASBI): A new assessment of social competence in high-risk three year olds. *Journal of Psychoeducational Assessment*, 10, 230-239.
- Jameson, P. B., Gelfand, D. M., Kulcsar, E., & Teti, D. M. (1997). Mother-toddler interaction pattern associated with maternal depression. *Development and Psychopathology*, 9, 537-550.
- Kochanska, G., Kuczynski, L., Radke-Yarrow, M., & Welsh, J. D. (1987). Resolution of control episodes between well and affectively ill mothers and their young children. *Journal of Abnormal Child Psychology*, 15, 441-456.
- Kochanska, G., Tjebkes, T. L., & Forman, D. R. (1998). Children's emerging regulation of conduct: restraint, compliance, and internalization from infancy to second year. *Child Development*, 69, 1378-1389.
- Kopp, C. B. (1982). Antecedents of self-regulation: A developmental perspective. *Developmental Psychology*, 18, 199-214.
- Kuczynski, L., Kochanska, G., Radke-Yarrow, M., & Girnius-Brown, O. (1987). A developmental interpretation of young children's noncompliance. *Developmental Psychology*, 23, 799-806.
- Leadbeater, B. J., Bishop, S. J., & Raver, C. C. (1996). Quality of mother-toddler interactions, maternal depressive symptoms, and behavior problems in preschoolers of adolescent mothers. *Developmental Psychology*, 32, 280-288.
- Lyons-Ruth, K., Zoll, D., Connell, D., & Grunebaum, H. U. (1986). The depressed mother and her one-year-old infant: environment, interaction, attachment, and infant development. In E. Z. Tronick & T. Field (Eds), *Maternal depression and infant disturbance* (pp. 61-82). San Francisco: Jossey-Bass.

NICHD Early Child Care Research Network (1998a). Relations Between Family Predictors and Child Outcomes: Are they weaker for Children in Child Care? *Developmental Psychology*, vol. 34, No. 5, 1119-1128.

NICHD Early Child Care Research Network (1998b). Early Child Care and Self-Control, Compliance, and Problem Behavior at Twenty-Four and Thirty-Six Months. *Child Development*, August 1998, vol. 69, No. 4, 1145-1170.

NICHD Early Child Care Research Network (1999a). Child Care and Mother-Child Interaction in the First 3 Years of Life. *Developmental Psychology*, 1999, vol. 35, No. 6, 1399-1413.

NICHD Early Child Care Research Network (1999b). Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months. *Developmental Psychology*, 35, 1297-1310.

Radke-Yarrow, M., Nottelmann, E., Belmont, B., & Welsh, J. D. (1993). Affective interactions of depressed and nondepressed mothers and their children. *Journal of Abnormal Child Psychology*, 21, 683-695.

Radloff, L. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Journal of Applied Psychological Measurements*, 1, 385-401.

Richters, J. E. (1992). Depressed mothers as informants about their children: a critical review of the evidence for distortion. *Psychological Bulletin*, 112, 485-499.

Richters, J., & Pellegrini, D. (1989). Depressed mothers' judgments about their children: an early examination of the depression-distortion hypothesis. *Child Development*, 60, 1068-1075.

Rutter, M. (1990). Commentary: some focus and process considerations regarding effects of parental depression on children. *Developmental Psychology*, 26, 60-67.

Rutter, M. & Quinton, D. (1984). Parental psychiatric disorder: effects on children. *Psychological Medicine*, 14, 853-880.

Schaughency, E. A. & Lahey, B. B. (1985). Mothers' and fathers' perceptions of child deviance: roles of child behavior, parental depression, and marital satisfaction. *Journal of Consulting and Clinical Psychology*, 53, 718-723.

Teti, D. M., Gelfand, D. M., & Pompa, (1990). Depressed mothers' behavioral competence with their infants: demographic and psychosocial correlates. *Development and Psychopathology*, 2, 259-270.

Vaughn, B. E., Kopp, C. B., & Krakow, J. B. (1984). The emergence and consolidation of self-control from eighteen to thirty months of age: Normative trends and individual differences. *Child Development*, 55, 990-1004.

Vandell, D. (1979). The effects of playgroup experience on mother-son and father-son interactions. *Developmental Psychology*, 15, 379-385.

Webster-Stratton, C., & Hammond, M. (1988). Maternal depression and its relationship to life stress, perceptions of behavior problems, parenting behaviors, and child conduct problems. *Journal of Abnormal Child Psychology*, 16, 299-315.

Winer, B. J. (1971). *Statistical Principles in Experimental Design* (2nd. Ed.). New York: McGraw Hill.

Whiffen, V. E. & Gotlib, I. H. (1989). Infants of postpartum depressed mothers: temperament and cognitive status. *Journal of Abnormal Psychology*, 98, 274-279.

Zahn-Waxler, C., Cummings, E. M., McKnew, D. H., & Radke-Yarrow, M. (1984). Altruism, aggression, and social interactions in young children with a manic-depressive parent. *Child Development*, 55, 112-122.

Zahn-Waxler, C., Iannotti, R. J., Cummings, E. M., & Denham, S. (1990). Antecedents of problem behaviors in children of depressed mothers. *Development and Psychopathology*, 2, 271-291.